

**A PROCESS SYSTEM HEALTH INDEX AND METHOD OF USING THE
SAME**

ABSTRACT OF DISCLOSURE

A method of monitoring a processing system for processing a substrate during the course of semiconductor manufacturing is described. The method comprises acquiring data from the processing system for a plurality of observations. It further comprises constructing a principal components analysis (PCA) model from the data, wherein a weighting factor is applied to at least one of the data variables in the acquired data. The PCA mode is utilized in conjunction with the acquisition of additional data, and at least one statistical quantity is determined for each additional observation. Upon setting a control limit for the processing system, the at least one statistical quantity is compared with the control limit for each additional observation. When, for example, the at least one statistical quantity exceeds the control limit, a fault for the processing system is detected.